

WHAT IS CLAIMED IS:

1. A spread illuminating apparatus comprising:

at least one light source;

a light conductive plate which has the at least one light source disposed toward one end surface thereof, introduces light emitted from the at least one light source thereinto through the one end surface, and which allows the light introduced thereinto to exit out from a light exit surface thereof toward an object to be illuminated; and

at least one light controlling means disposed between the at least one light source and the light conductive plate, and defining a light entrance surface and a light exit surface, the at least one light controlling means having a refractive index profile formed in both directions parallel to and vertical to the light exit surface of the light conductive plate.

2. A spread illuminating apparatus according to Claim 1, wherein the refractive index profile of the at least one light controlling means is formed such that a refractive index decreases with an increase in distance from a center of the light entrance surface of the at least one light controlling means with respect to the both directions parallel to and vertical to the light exit surface of the light conductive plate.

3. A spread illuminating apparatus according to Claim 1, wherein the refractive index profile of the at least one light controlling means is formed such that a refractive index decreases with an increase in distance from a center of the light entrance surface of the at least one light controlling means with respect to the direction vertical to the light exit surface of the light conductive plate, and that a refractive index increases with an increase in distance from the center of the light entrance surface of the at least one light controlling means with respect to the direction parallel to the light exit surface of the light conductive plate.

4. A spread illuminating apparatus according to Claim 1, wherein the refractive index profile of the at least one light controlling means is formed such that a refractive index increases with an increase in distance from a center of the light entrance surface of the at least one light controlling means with respect to the direction vertical to the light exit surface of the light conductive plate, and that a refractive index decreases with an increase in distance from the center of the light entrance surface of the at least one light controlling means with respect to the direction parallel to the light exit surface of the

light conductive plate.

5. A spread illuminating apparatus according to Claim 1, wherein the refractive index profile of the at least one light controlling means is formed such that a refractive index decreases with an increase in distance from a center of the light entrance surface of the at least one light controlling means with respect to the direction vertical to the light exit surface of the light conductive plate, and that a refractive index increases and decreases repeatedly with respect to the direction parallel to the light exit surface of the light conductive plate.

6. A spread illuminating apparatus according to any one of Claims 1 to 5, wherein the at least one light controlling means has a height substantially equal to a height of the one end surface of the light conductive plate, through which light emitted from the at least one light source is introduced into the light conductive plate.

7. A spread illuminating apparatus according to any one of Claims 1 to 6, wherein the light entrance surface and the light exit surface of the at least one light controlling means are parallel to each other.

8. A spread illuminating apparatus according to any one of Claims 1 to 7, wherein the light entrance surface and the light exit surface of the at least one light controlling means are connected respectively to a light emitting surface of the at least one light source and to the one end surface of the light conductive plate by means of adhesive which can transmit light emitted from the at least one light source.

9. A spread illuminating apparatus according to any one of Claims 1 to 8, wherein the at least one light controlling means is structured such that a plurality of transparent rectangular solids are stacked one over another vertically and horizontally, and that the transparent rectangular solids are put together by means of adhesive which can transmit light emitted from the at least one light source.

10. A spread illuminating apparatus according to Claim 9, wherein the plurality of transparent rectangular solids are formed of resin.

11. A spread illuminating apparatus according to Claim 9, wherein the plurality of transparent rectangular solids are formed of glass.

12. A spread illuminating apparatus according to any one of Claims 1 to 9, wherein the refractive index profile of the at least one light controlling means defines a smoothly curved envelope.
13. A spread illuminating apparatus according to Claim 9, wherein the adhesive to put together two adjacent rectangular solids has a refractive index which is at least equal to a refractive index of one of the two adjacent rectangular solids having a smaller refractive index, and which is at most equal to the other one thereof having a larger refractive index.
14. A spread illuminating apparatus according to Claim 1, wherein each of the at least one light controlling means has one of the at least one light source located at a center of the light entrance surface thereof.